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ABSTRACTS OF TUBERCULOSIS

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Knowledge about Tuberculosis.—In order to ascertain how much the knowledge of tuberculosis is disseminated throughout the population, 633 individuals were given questionnaires, containing questions about the general nature, transmissibility and prevention of tuberculosis. These 633 people comprised people with academic education, members of the middle social strata, skilled and unskilled laborers and students. Half of the people were males, half females. Analyzing the returns, it was found that roughly only one-half of all persons asked had anything like correct knowledge of these fundamental questions.—*Über die Kenntnisse von der tuberkulose in der Bevölkerung, A. L. Peitmann, Beitr. z. Klin. d. Tuberk., April, 1933, lxxxii, 549.*—(*M. P.*)

Roentgenograms as Legal Evidence for Abortion for Tuberculosis.—Several problems are concerned in the relationship between the X-ray picture and induced abortion in pulmonary tuberculosis. The state (Germany) holds to the position that an X-ray picture must be taken as proof of an existing pulmonary tuberculosis. If induced abortion is indicated, fluoroscopic and physical examination are not sufficient. To the layman (prosecuting attorney, lawyer) the X-ray apparently reveals with certainty the existence of active pulmonary tuberculosis or previous pulmonary tuberculosis even after months or years, or the reactivation of a tuberculous lesion. This obviously is erroneous. Primary or beginning pulmonary tuberculosis may often not be recognized on the X-ray; a healed tuberculous lung may appear normal on the X-ray and the X-ray may give no indications as to activity.—*Roentgenbild, W. Liepmann, Deutsche med. Wchnschr., February 3, 1933, lix, 176.*—(*H. S. W.*)

Working Capacity of Consumptives.—The clinical findings, sociological environment, and economic status of 10 men, resident at Preston Hall with relatively advanced pulmonary tuberculosis, are reviewed. The sputum has been positive in all cases and is still so in seven. During the five-year period prior to their admission to the village settlement these men have had an average of 120 days per man per annum of sanatorium treatment. Since being admitted to the settlement their average earning capacity has been £106, 8s, 6d, a year. The average number of days *per-annum* absenteeism from all causes, including tuberculosis, was 44.8. Only two men are doing work in which they had training prior to their admission to the settlement. The cost of treatment of these 10 men has been markedly decreased under the village-settlement scheme.—*The Working Capacity of the Consumptive, J. B. McDougall, Brit. M. J., March 25, 1933, no. 3768, 504.*—(*T. O. R.*)

Relapse in Pulmonary Tuberculosis.—Since relapse occurs in an undue proportion

of patients apparently successfully treated by sanatorium and collapse therapy, the suggestion is made that attempts to prevent relapse might well follow along the lines of desensitization by means of tuberculin. A distinction is made between true relapse, with the appearance of fresh lesions in parts of the lungs previously without demonstrable lesions, and the insidious direct spread of lesions already present, designated as simply evidence of inefficient treatment. A large number of patients coming to treatment already have been brought to more or less permanent ill health by successive relapses. The lack of proper "after-care" apparently is not the determining factor in relapses, since certain patients receiving proper after-care relapse, and certain others not cared for at all do not relapse. Relapse can be studied best under institutional conditions. A case illustrating typical relapse is described in detail, and the point is made that the appearance of the new lesion was accompanied by so few symptoms that, had it occurred outside of a sanatorium, the lesion probably would have been advanced before it was detected. The belief is stated that these fresh areas of disease are due to haematogenous deposits of tubercle bacilli in the interstitial tissue of the lung, setting up around themselves allergic reactions of simple acute inflammation. Thus the roentgenographic shadow may represent a small core of tuberculosis and a large capsule of acute inflammation. The fate of this composite lesion depends partly upon the patient's individual resistance to tuberculosis, partly on his environment and treatment, and partly on the intensity of the allergic reaction, which, though partly beneficial, is not entirely so. Either the lesion heals, leaving a minimal scar, or, as the inflammation subsides, the tuberculous core spreads into the damaged or necrosed surrounding tissue, and an active, spreading "intermediate" lesion results. The time required to produce symptoms depends upon the rate of spread and the erosion of a patent bronchiole with subsequent complicating secondary pyogenic infection. The influence of secondary infection must be postulated to explain why so many patients tolerate the tubercle bacillus and its lesions without symptoms while others do not. Five salient features of relapse are enumerated, as follows: (1) lack of prodromes; (2) "silence" of new deposits, both as to symptoms and as to physical signs which, if present, usually are evanescent; (3) an indefinite latent period before the second reappearance of symptoms. Closer roentgenographic and clinical control during the critical two years following institutional treatment is indicated, but since the greater part of the lesion of relapse is a simple allergic inflammation, the belief is expressed that to render hypersensitive patients less sensitive would to a great extent protect them. Against Heimbeck's experience with nurses and students at Oslo are quoted figures, as follows: 93,979 South African natives applying for mining employment, 61,115 gave positive intracutaneous reactions to a 1 to 5000 dilution of Old Tuberculin. Of these, 3,879 were highly sensitive, while 57,236 were less sensitive. Among the highly sensitive the incidence of subsequent clinical tuberculosis was 1.03 per cent, while among the less sensitive it was 0.65 per cent. It is emphasized that Heimbeck was dealing with primary tuberculous infection and resulting clinical disease in noninfected people exposed to the bacillus for the first time, while the South Africans provide an example of the likelihood of the appearance of secondary pulmonary tuberculosis and its subsequent relapses in a previously infected population.—*The Problem of Relapse in Chronic Pulmonary Tuberculosis, R. C. Wingfield, Lancet, June 3, 1933, ccxxiv, 1166.*—*(R. M. F.)*

Tuberculosis Morbidity Rates and Unemployment.—Total unemployment and short hours in Germany have reduced the morbidity of pulmonary tuberculosis considerably. The general social and employment conditions have a greater influence on the rate of tuberculosis morbidity than does the bacillus itself. The general nutrition of the German people has not deteriorated in the last few years as much as it did in the immediate postwar period, but the burden of work has greatly diminished and thus the decrease in tuberculosis morbidity in the present crisis may be explained. The great decrease of pulmonary tuberculosis in the unemployed proves that bodily overtaxing was a factor in the previous occupational work.—*Ursache und Bedingungen in der Tuberkulosefrage, Ascher, Deutsche med. Wchnschr., December 23, 1932, lviii, 2036.*—*(H. S. W.)*

Incidence of Tuberculous Infection.—The fact that infection with *B. tuberculosis* in the preceding generation was universal in civilized communities has been accepted as proved and any exceptions have been rightly regarded as negligible. At the present time universal infection is by no means the rule. There has been an important fall in the death-rate since the beginning of the present century. Reaction to tuberculin is certain evidence of infection. Failure to react implies absence of infection, although there are several well-known conditions which tend to give negative reactions. The Pirquet is

about as reliable as the intracutaneous test when 0.1 mgm. of tuberculin is used. Comparison of the published tables of tuberculin reactions from widely different areas in Europe and America shows: (1) a high percentage of reactors before 1914; (2) a very high incidence of infection in children living in contact with tuberculosis; (3) a lower percentage of reactors in the general child population in civilized communities; (4) a remarkable diminution in infection in children in rural communities and in cities which show falling death-rates from tuberculosis; (5) many uninfected young adults. The age at which infection occurs is the least important of the factors which produce disease. But the race of the individual, his social intelligence, habits, economic and housing conditions, food-supply and the strain of infecting microörganism all have their influence.—*Infection with Bacillus Tuberculosis in Europe and North America, B. R. Clarke, J. State Med., April, 1933, xli, 218.—(J. F. B.)*

Tuberculosis in Regular Army Officers.—Since January, 1923, 102 officers of the U. S. Regular Army have been admitted to Fitzsimmons General Hospital because of chronic pulmonary tuberculosis. Junior officers furnish the majority of admissions, and the Medical Corps stands out with a higher percentage of admissions than any other branch of the service. Forty-four were returned to duty after treatment. Of these, 20 were later readmitted because of reactivation of their pulmonary lesion; 11 of these were again returned to duty. Of 33 officers who were retired 27 are living. Of the whole group, 14.7 per cent had haemoptyses, and 61.7 per cent cavities, while only 9.8 per cent showed both cavity and, at some time or other, haemorrhage. Fifty-one per cent had cavities but no record of haemoptysis, and 5 cases had haemoptysis without demonstrable cavity. Half of those with cavity and haemoptysis have either died or been retired, and only two have been returned to duty. Forty-nine per cent of those with cavity without haemoptysis have died or been retired, and 28.3 per cent have been sent to duty. Of those with haemoptysis without demonstrable cavity, four were returned to duty and one is still in the hospital. Of those with clinical tuberculosis without haemoptysis and without evidence of cavity, 67.6 per cent were returned to duty, 20.5 per cent were retired, and 2.9 per cent died, while 8.8 per cent are still in the hospital. Only 28 per cent of those with positive sputum were returned to duty, 33.3 per cent were retired and 15.7 per cent died, while of those with negative sputum 62.2 per cent were returned to duty, 22.2 per cent retired, and 2.2 per cent died. Eighty-one per cent did not require any therapy other than hygienic-rest treatment, or their tuberculosis was so distributed that other measures were not feasible. Of 10 who received artificial pneumothorax, one returned to duty; of three who received thoracoplasty, 2 returned to duty. No others of the 19 who received some form or combination of forms or collapse therapy returned to duty.—*Tuberculosis in Officers of the Regular Army, A. T. Cooper, Ann. Int. Med., March, 1933, vi, 1200.—(E. H. K.)*

Tuberculosis in China.—This is a review of the sparse and largely unreliable data which are available on the question of the dissemination of tuberculosis in China. From the few figures that are available from pathological work and from tuberculin tests, it would appear that tuberculosis is not much more frequent in China than it is in Europe, and that its clinical forms are about the same. But it is likely that practically all available figures remain far behind the actual number of cases.—*Beitrag Zur Frage der Tuberkuloseverbreitung in China, Pan Dschi Kou, Beitr. z. Klin. d. Tuberk., April, 1933, lxxxii, 641.—(M. P.)*

Tuberculosis in Norway.—The occurrence and spread of tuberculosis were investigated in a Norwegian medical district comprising ten separate areas. The economic standard was average. Three hundred and fifty homes and 3,550 people were examined, including 99.4 per cent of the permanent inhabitants of the district. Cleanliness was relatively good, although the dwelling places were crowded. No relation was discovered between economic, sanitary and dwelling conditions, and tuberculosis mortality and infection. In this district in the period 1900–1930, 326 deaths from tuberculosis occurred, 70.4 per cent of which were pulmonary. The average mortality for the 31 years was 2.79 per thousand reckoned for the population of 1927–1928. The total number of deaths from tuberculosis was four times as high in 1901 as 1930. The 326 tuberculosis deaths occurred in 193 homes, an average of 1.69 deaths per home. Sixty-two per cent of the farm mortality occurred in 10.9 per cent of the farms. The highest tuberculosis mortality occurred at the age-periods 1–2, 20–32 and around 60. The lowest occurred in the age-group 4–12 years.

Fifty-two and five-tenths per cent of the population reacted positively to the Pirquet test in 1927–1928, the curve rising from 0.9 per cent at 2 years to 94.0 per cent at 40. Eleven per cent of the population below 18 years reacted positively. No bovine tuber-

culosis has occurred in the people of the district since 1915. Twenty per cent of children drinking raw milk from tuberculin-positive cattle did not react to tuberculin. Home infection in cases of pulmonary tuberculosis was carefully traced, and the source of infection determined in all persons of the permanent population under 18 years of age, 97.2 per cent of the cases being due to other cases of pulmonary tuberculosis. All were infected within a home, and 85 per cent of them in their own homes. No tuberculosis appeared to have been contracted in the open air. Two-thirds of the tuberculosis deaths were from intrafamilial infection. Simple dwelling infection was not observed, and no infection seemed transmitted from lifeless objects. In the homes droplet infection seemed the common mode of transmission. In 1,868 people giving evidence of infection signs of clinical tuberculosis were present in 18.4 per cent. In 261 cases in which the source of infection was known, clinical manifestations appeared in close conjunction with the primary infection in 23.4 per cent, in conjunction with superinfection in 18 per cent, and as an expression of endogenous metastasis in 58.6 per cent.—*The Epidemiology of Tuberculosis: Studies of the Occurrence and Modes of Spread of Tuberculosis in a Medical District in Norway, S. Lunde, Acta Tuberc. Scand., 1933, vii, 97.*—(*E. R. L.*)

Climate of South Africa and Tuberculosis.—Generally, South Africa is a land of sunshine. Nelsport Sanatorium is 370 miles from Cape Town and at an elevation of 3,318 feet. Meteorological reports show a daily average of sunshine, varying from 6 to 11 hours, and daily average ultraviolet, varying from 4.06 to 9.30 during the year. The mean velocity of the wind varies from 4.7 to 8.4 miles per hour. August is the most windy and April the least windy month. Over a period of 8 years, 75 per cent of all haemoptyses in the Sanatorium have occurred in April. Exact information regarding tuberculosis in South Africa many years ago is unobtainable. Stories of travellers give the impression that tuberculosis healed rapidly in this climate. There were no sanatoria, and no special care was given to patients. The death rate in the white population has fallen from 221 per 100,000 in 1902 to 97 in 1932 in Cape Town. In the Union of South Africa it fell from 50.5 in 1912 to 36.1 in 1922. Registration of deaths is not complete in the colored natives, but in Cape Town the rate varied from 912 in 1903 to 346 in 1922 and 505 in 1930. Results of sanatorium treatment show that of 100 white patients 31 were alive after 5 years, while of 71 colored patients only 21 per cent were alive. Among Europeans in Africa, tuberculosis seems to be increasing, which may be due to diminishing resistance. Among the native population in general, tuberculosis is a widespread disease. It is more acute in the colored natives, but succeeding generations of Europeans seem to lose their resistance to it.—*The Effect of the South African Climate on Pulmonary Tuberculosis and Pretuberculous Cases, P. Allan, Brit. J. Phys. Med., December, 1932, vii, 161.*—(*J. F. B.*)

Incidence of Tuberculosis at Autopsy.—It was planned to examine a consecutive series of autopsies for the presence of tuberculous alterations. Such a study was deemed necessary because, in spite of similar work, none seems to be complete and reliable as regards the different methods of diagnosis and random sampling. Such differences account undoubtedly for the vast differences in the results. A total of 100 cases was so examined, with the exception of children under 16 years of age and adults beyond the age of 60. Unless obvious tuberculous lesions were present a thorough search was made for small calcified foci. In order to ascertain the diagnosis, histological sections were made in all cases. When sufficient material was available an attempt was made to demonstrate tubercle bacilli by direct smear, on culture, histologically and by animal inoculation. Previous statistics vary between 10 and 100 per cent. In 85 per cent of the cases, undoubted tuberculous alterations were found, and in 9 per cent tuberculosis was the cause of death. In 13 per cent anthracotic scars were found, but as yet the discussion is not closed as to whether all of them are tuberculous in origin. The weight of the evidence seems to favor the opinion that such scars are practically all tuberculous. If this is assumed 98 per cent of all bodies showed tuberculous alterations.—*Untersuchungen über die Häufigkeit tuberkulöser Veränderungen am Leichenmaterial unter Benützung aller Methoden des Nachweises, E. Winkler, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 655.*—(*M. P.*)

Compulsory Examinations of Students at Lemberg University.—Since the school-year, 1930–1931, every individual who wishes to study at the Johann Kasimir University (Lemberg) must undergo a compulsory medical examination and contagious cases of pulmonary tuberculosis are not allowed to matriculate. The examination includes a fluoroscopy and X-ray films of the chest and measurement of temperature, and in special cases examination of the sputum for tubercle bacilli, and sedimentation and other significant tests. Among 3,005 stu-

dents (2,089 men and 916 women) examined by 6 internists and 4 roentgenologists in 13 days, there were 1.69 per cent with tuberculous changes suitable for treatment, 5.5 per cent to be kept under observation, and 13.9 per cent with healed tuberculous changes. In the different age-groups the incidence of the above varied. In the majority of cases the individuals of the first two groups were not aware of their condition. In many cases the roentgen examinations revealed changes not discernible by physical methods (percussion and auscultation) (*Tuberculosis inapparenta* (Braeuning)). Compulsory examination offers one of the most important protective measures, in removing the source of infection, and in permitting supervision of the case with closed tuberculosis.—*Ergebnisse der Reihenuntersuchungen an der Universität in Lwow im Jahre 1930, Z. Czezowska, W. Grabowski and S. Hornung, Ztschr. f. Tuberk., 1932, lxvi, 38.*—(*H. J. C.*)

Compulsory Chest X-Raying of Munich High-School Pupils.—Elaborating previous studies, the author reports further observations made on high-school students of Munich, which justifies compulsory chest-raying. The report covers about 16,000 cases and the figures are compared with those obtained in other communities (Hannover, Lemburg). A decrease, as recorded by Kayser-Petersen, in the frequency as compared with previous years, was not noted by the author, who found an increased incidence. Epidemiological curves are presented, and the question raised of whether the acme of tuberculosis frequency lies in the age-span up to 25 years. The influence of the seasons is discussed.—*Das Dritte Jahr Pflicht-Thoraxdurchleuchtung an den Münchener Hochschulen, B. Kattentidt, Ztschr. f. Tuberk., 1932, lxvi, 24.*—(*H. J. C.*)

Tuberculosis Survey of Schoolboys of Kiel.—In serial X-ray examinations over a period of three years the findings verified those for the individual years. X-ray examination outranks clinical observation in value. In male youths the main period of infection does not coincide with puberty, nor was an increase of positive cases observed during student years. The positive cases were divided fairly equally among the various vocations. A more important rôle was played by contact with diseased family associates, though heredity also was a factor in incidence. The anamnesis did not always prove satisfying. Attempts to classify the cases according to constitutional forms proved worthless. The rare case found negative on first roentgen examination and later showing disease warranted the warning that a negative finding need not assure subsequent freedom from tuberculosis. Treatment in early cases proved highly gratifying. Strict supervision without unnecessary pessimism is advised.—*Ergebnisse bei dreijährigen systematischen Ruhendurchleuchtungen an Kieler männlichen Jugendlichen und Schülern, Büsing, Ztschr. f. Tuberk., 1933, lxviii, 78.*—(*H. J. C.*)

Children in Tuberculous Surroundings.—The study includes, to date, 1,330 children, of which 321 of a total of 723 children previously observed were further followed and 607 new additions are noted. As recorded previously, hygienic relations are predominant. Among the newly observed children, living under favorable influences, the tuberculosis mortality diminished to 2.6 per cent, as compared to 9.4 per cent in unfavorable hygienic surroundings. The attainment of a satisfactory hygienic environment should, therefore, be the main endeavor of dispensaries in the combat against tuberculosis. An adequate dispensary personnel, reënforced with sufficient funds and police power to enforce the necessary sanitary measures, is essential. A certain proportion of the children revealed a natural resistance to tuberculosis, which not only protected them against chronic tuberculosis in unfavorable hygienic surroundings, but also made them insusceptible to tuberculin.—*Weitere Ergebnisse einer Umfrage über die Verhältnisse bei Kindern in tuberkulöser Umwelt, E. Seiffert, Ztschr. f. Tuberk., 1932, lxvi, 203.*—(*H. J. C.*)

Phthisis in Adolescents and Young Adults.—With the exception of young females between the ages of 15 and 25 years, there has been a steady decline recently in the death-rate from tuberculosis of all forms, in both sexes and at all ages. Radiographs are essential for early diagnosis and the control of treatment. Symptoms are more reliable than physical signs in diagnosis. The exudative type of disease is that commonly encountered. Collapse therapy is effective in curing many cases of grave disease, and early treatment cures most of the less virulent forms. The intravenous injection of gold salts is sometimes followed by resolution of recent disease. Owing perhaps partly to increasing racial immunity, but much more, to radiology, and collapse therapy, the outlook for the young consumptive need no longer be regarded as hopeless.—*Phthisis in Adolescence and Early Adult Life, W. B. Wood, Brit. M. J., March 25. 1933, no. 3768, 509.*—(*T. O. R.*)

Tuberculin Reaction in Aged.—The author tested 110 patients between 60 and 90 years of age, using the Mendel-Mantoux tuberculin test (0.1 cc., 1:5000 O.T., with 0.9 sodium chloride as control). The test in the aged, with and without tuberculosis, is valueless, either negatively or positively, and is of no diagnostic significance.—*Die Tuberkulinreaktion bei Alterstuberkulosen, R. Mayer, Ztschr. f. Tuberk., 1933, lxviii, 60.—(H. J. C.)*

Reinvestigation after Tuberculin Tests.—After an interval of one and a half to two years, 700 children, whose ages varied from 1 to 15 years at the time of the first test, were retested with Old Tuberculin by the intracutaneous method and were examined for signs of tuberculosis. Of these children 164 were contact cases. In over 96 per cent of the cases positive reactors remained positive. In at least 31 out of 54 cases the change from negative to positive reaction took place without any notable disturbance to the health of the child. The number showing this change was regarded as higher than usual and was attributed to the method of testing. Many children were subjected to the Pirquet test during the first examination, whereas the intracutaneous test was done on all children during this reinvestigation. A comparison of the different dilutions of tuberculin which produced a positive reaction demonstrated a tendency for the degree of sensitivity to have increased during the interval of examinations. On separating the children into contact and noncontact groups, it became evident that a high degree of sensitivity in contact children was reached at an early age, whereas in a large percentage of noncontact children this degree of allergy was not reached at any age. Seven of the 700 children had pulmonary tuberculosis when first examined, but all had improved and the disease was quiescent at the time of the second test. Of the remainder none developed clinical tuberculosis. This number included 24 who were under 5 years when first positive to tuberculin and of these 2 were under 2 years of age. That these children have remained apparently healthy throws doubt on the view that a positive tuberculin reaction in a child under 2 years of age is evidence of active tuberculous disease.—*A Reinvestigation of Children Previously Examined by Tuberculin Tests, W. E. Lloyd and A. Margaret C. MacPherson, Brit. M. J., May 13, 1933, no. 3773, 818.—(T. O. R.)*

Tuberculosis Problem in South.—Since 1918 the death-rate from tuberculosis in the United States has dropped from 150 to 70.7 per hundred thousand and that of the Southern conference area from 140 to 80.4. The reason for the higher mortality rate in the Southern conference area is the fact that 80 per cent of the Negroes in the United States are to be found in this area. The Negro death-rate is from two and one-half to three times that among the white population. In the fifteen-year period prior to 1926, however, the reduction in the tuberculosis mortality rate for Negroes was 44 per cent. This should offer encouragement as to the possibilities of improving the tuberculosis situation among Negroes. In a recent survey of the Southern States, there was found an average of 55 per cent reactors among Negro and white children in rural areas in which all factors are carefully controlled. The intracutaneous test has proved quite satisfactory. The experience of Southern physicians shows that many cases are seen by them but a short time prior to death, particularly in the case of the Negro. Organized effort, therefore, which appreciates and strives to overcome the difficulties experienced by the "key-man"—the family physician—seems to offer much hope for success. A reasonable program which might be adopted for joint effort on the part of the physicians and the health organization should be laid down along the following lines: *1:* A program of education embracing newspaper publicity, lectures, radio talks, promotion work with families and contacts, tuberculin testing of family groups, arrangement for distribution of sputum cups, laboratory containers and pamphlets, and the institution of isolation procedures. *2:* The investigation and study of the families in all deaths on record in any given community or area. *3:* A complete survey of all families in which there exists a known, manifest case of tuberculosis, with the inauguration of measures for prevention of spread. *4:* Classification of all suspects on record through local diagnostic facilities. *5:* The stressing of the needs for local hospital and diagnostic facilities and the provision of funds necessary for their maintenance. *6:* In the absence of proper hospital facilities, treatment of domiciliary tuberculous cases by the local medical profession, with recognized agencies giving all possible aid in the matter of nursing and control services. Within the past two years the Rockefeller Foundation arranged to make financially possible a study by the Health Department of Alabama that will eventually result, it is hoped, in further expanding and superimposing on an already existing county set-up a simple and workable plan of local tuberculosis control. The essentials of the plan of procedure are as follows: *1:* The family or household is the unit of study and all families in which there is or has been

tuberculosis will be the nucleus for the study of the disease. *2:* The search for new cases will be conducted on a county-wide basis. *3:* A complete tuberculin survey will be undertaken to include (a) all school children, both white and colored; (b) adults and preschool children by precincts or beats; and (c) municipal and industrial groups. *4:* In areas selected, an epidemiological survey of the families within the areas will be made, with follow-up roentgen examination of selected positive reactors. *5:* The clinic is mobile and equipped with portable X-ray apparatus. Convenient points within the county have been selected as clinic centres. *6:* The value of frequent sputum examinations is emphasized to physicians and patients. *7:* All families in which manifest tuberculosis exists are recorded individually, by family. *8:* General educational measures are carried on both by the clinic and by the county health staff. Excellent coöperation is being had through the organized local profession. *9:* When a sufficiently large group of manifest tuberculosis cases have been discovered, over the age of 18 years, the preventive phase of the program will be initiated. This will consist of a division of these families into a study and control series, with the initiation of isolation of cases in the study group.—*The Rural Tuberculosis Problem in the South, J. N. Baker, J. Am. M. Ass., July 29, 1933, ci, 333.*—(*G. L. L.*)

Eradication of Tuberculosis.—Tuberculosis is a preventable disease. It has been universal in its distribution. Plague caused the death of 70,000 people in 1665 in a dramatic manner, but tuberculosis probably caused an equal number of deaths in its insidious way. It has been estimated that, by 1815, one-quarter of the population of Europe was carried away prematurely. Among British soldiers in Canada from 1830 to 1837 the death-rate from tuberculosis was 2,300 per 100,000. Great satisfaction was expressed when the rate fell to 950 in the decade from 1863 to 1872. Wars in the nineteenth century in Europe killed 14,000,000 people but it is estimated that tuberculosis caused the deaths of 30,000,000. The late war killed 8,405,280 persons but tuberculosis caused the death of 6,000,000 in the same period. From the beginning of the last century tuberculosis death-rates show a distinct decrease. From 1900 to 1928 the death rate per 100,000 fell in Switzerland from 272 to 134.5, in Scotland from 233 to 96, in the United States from 201.9 to 79.2, and in Ireland from 288 to 138. It is believed by some that medical measures and the antituberculosis campaign adopted by the profession led to this fall. But this is doubtful for the decrease began before the antituberculosis campaign started. Physicians can do a great deal for tuberculous patients, but cures cannot be guaranteed. Many patients are cured but many more are merely patched up. Progressive tuberculinization cannot be given credit for the decreased death-rate, for the decrease has been too rapid, and it would have given increased immunity or protection in the past war but the rate actually increased. Tuberculosis is the "index disease." When the death-rate from tuberculosis rises conditions of life are bad and when the rate falls the conditions become more satisfactory. By sanitation is meant the application of measures to prevent disease and improve health. Sanitation includes such matters as factory legislation, drainage, food-control and other like measures. Tuberculosis is decreasing because of this indirect attack, sanitation, and not because of the direct attack upon tuberculous patients. Study of conditions in Scotland shows this. Its climate is unreliable, it has more than its share of rainy, stormy days and fewer days filled with sunshine, its slums and general housing conditions are notoriously bad, and financially its people are poor. Yet in spite of all these adverse factors the excellent work of health-officers has reduced the tuberculosis death-rate by 78.2 per cent in the past 60 years. From 1870 to 1910 tuberculosis was the leading cause of death. In 1920 it was the third most common cause of death, and in 1930 it ranked fourth. The fall in the tuberculosis death-rate has been twice as great as the fall in the general death-rate. Pulmonary tuberculosis is primarily the result of infection by the human type of tubercle bacillus. Other tuberculous disease is considered as infection by the bovine tubercle bacillus. Since 1910 nonpulmonary tuberculosis has decreased much more rapidly than pulmonary tuberculosis. The greatest factor in this has been the pasteurization of milk. Tuberculosis ranks fourth in the causes of death, but its importance is greater because it takes relatively young lives, while heart disease, cancer and pneumonia, as a rule, take lives that have passed the period of greatest productivity. There has been a definite fall in the tuberculosis death-rate of young adults. The question regarding when tuberculosis will be eradicated cannot be answered. By mathematical computation from the figures from 1870 to 1930 the proportional equation gives the answer 1942. By the same method comparison of the rates to 1910 would give 1943. If the calculation were made to 1920 the result is 1942 and if made to 1930 it is 1947. Such calculations cannot be accurate, but it must be seen that, although reduction in the death-rate from

now on must be slow, the rate trend can be shown and practical eradication be visualized. An average fall in the death-rate of 3.3 per cent *per annum*, the present rate and with present methods, over the next 30 years, would mean a death-rate of 27 per 100,000, and after a century it would be reduced to 4. Acceleration of the fall in death-rate can be accomplished by more rigid milk control and more adequate facilities for the care of tuberculosis patients. —*Statistical Evidence Pointing to the Possible Ultimate Eradication of Tuberculosis, J. Crocket, J. State Med., March, 1933, xli, 164.* —(*J. F. B.*)

Formalin Disinfection in Tuberculosis.—The disinfection of rooms with formalin is the most efficient method of killing tubercle bacilli in the homes of consumptives. Even the bacilli found in the depth of various materials are affected by the formaldehyde gas. In the state hospitals in Essen formalin disinfection in closed apparatus is displacing steam disinfection, and this kills tubercle bacilli at a depth and protects the most delicate materials. For the purpose of testing disinfection apparatus and bactericidal solutions, cultures of tubercle bacilli on egg media from silk threads containing bacilli after exposure are considered an exact and certain method.—*Die Wirkung von Formaldehyd auf den Tuberkelbazillus. Formalindesinfektion bei Tuberkulose, J. Hohn and W. Herrmann, Ztschr. f. Tuberk., 1933, lxviii, 145.*—(*H. J. C.*)

BCG.—On the basis of results with *BCG* in Gothenburg since 1927, Wallgren recommends intracutaneous administration of the vaccine and isolation of the vaccinated infants during the period of incubation until the tuberculin reaction becomes positive. The intracutaneous route is preferable to the oral because the absorbed dosage is known. The period of isolation is advised because the period before sensitization is one of high susceptibility. Wallgren believes the method is still in the experimental stage, and therefore recommends also that its use be restricted to infants in an environment rendering infection highly probable under ordinary circumstances. Since 1927, 194 infants have been vaccinated, 0.05 mgm. *BCG* being injected in the thigh. On the average 6 weeks passed before tuberculin sensitiveness was apparent. Of this group 97 from an environment of heavy exposure were considered most suitable for evaluating the method. One of the 97 had died from meningococcic meningitis. No tuberculosis was found at autopsy. Ninety-six were alive at the time of analysis of the data, 92 of them showing no tuberculosis by X-ray, and 4 some hilum involvement. None manifested clinical tuberculosis. The mortality of 1.7 per cent in this group is contrasted with the rate of 3.4 per cent in corresponding infants in the period 1922–26.—*Résultats d'un essai de rationalisation de la vaccination par le BCG, A. Wallgren, Acta Tuberc. Scand., 1933, vii, 72.*—(*E. R. L.*)

***BCG* in England.**—The decision not to recommend *BCG* vaccination in England is founded on the following arguments: *1:* Tuberculosis mortality in young children is decreasing steadily in Great Britain, and this decrease has been caused exclusively by measures of hygiene, isolation of contagious patients, and improved social conditions. *2:* It is difficult, and often impossible, to separate vaccinated babies from their contaminated families, although this is the essential condition of success in *BCG* vaccination. *3:* It is not yet established how long a child, vaccinated with *BCG*, may resist subsequent virulent infections. *4:* It is feared that the introduction of *BCG* would impair the efficiency of the usual measures of prophylaxis, in which the governmental and local authorities have the greatest trust. *Reply by Professor Calmette:* While the death-rate from all causes during the first year of life may have decreased, there has been no notable decrease of the death-rate from tuberculosis between the ages of 15 and 40 years, either in England or in other countries of Northern Europe, and the number of persons giving a positive tuberculin reaction is probably the same to-day as it was twenty years ago. It is rather Utopian to believe in the possibility of eradicating tuberculosis by measures of hygiene only, even if this were practicable on a large scale and the expense not too heavy, but preventive vaccination will extirpate the disease gradually if it is used methodically in all children immediately after birth. Only the presence in the human body of living tubercle bacilli, whether they be virulent or avirulent (*BCG*), renders it immune to tuberculosis. *BCG* requires about five weeks for the elaboration of immunity, and usually segregation of the vaccinated child can be arranged for this length of time. Even when this separation is not rigorous, protection is afforded, for the death-rate from tuberculosis in vaccinated children who continue to live in infected families is only one-sixth that of nonvaccinated children living in the same conditions. The duration of immunity varies in different cases, and may be prolonged by periodical revaccination. To maintain tuberculin allergy through puberty revaccination may be done every four or five years. The introduction of *BCG* vaccination would not impair the efficiency of the usual measures of

prophylaxis, but, judging by past experience with other diseases, would encourage such measures.—*BCG Vaccination against Tuberculosis. Prof. Calmette's Reply to the Ministry of Health, Lancet, March 25, 1933, ccxxiv, 653.*—(*E. H. K.*)

Tuberculosis in *BCG* Subjects.—Negro troops in the French colonial armies are recruited from environments free from the tubercle bacillus. On contact with civilization, tuberculization results in an acute, usually polyserous, and almost invariably fatal disease. Since 1929, on the arrival of new contingents, 200 tuberculin-negative soldiers were divided into two groups, one of which was vaccinated with *BCG* subcutaneously. In the vaccinated group, during 1930–1931, only 3 cases of clinical tuberculosis occurred. None were of the type distinctive of first infection (that is, invasive and rapidly progressive), but were of the adult type of the disease, with localized, stable lesions which responded adequately to therapy. This observation seems to indicate that vaccination with *BCG* produces an allergy as sufficient and as specific as that which follows the infrequent, minimal infection with the tubercle bacillus that is the lot of those living in civilized communities, and, similarly, results in immunity.—*Trois cas de surinfection tuberculeuse chez des vaccinés au BCG, Toullec, Rev. d. l. Tuberc., December, 1932, xiii, 1013.*—(*A. E. M.*)

***BCG* and Filterable Virus.**—May vaccination of children of tuberculous parents with *BCG* activate an infection by filterable elements of the tubercle bacillus transmitted by way of the placenta to the offsprings? To decide this question the following experiments were done: (a) pregnant guinea pigs were (1) inoculated with virulent human strains of tubercle bacilli, (2) injected intralymphadenally and intraperitoneally with filterable virus, and the offspring of each were vaccinated *per os* with 3 cgm. of *BCG*; (b) *BCG* was injected subcutaneously and intraperitoneally, and into the cervical lymph nodes and testicles of young guinea pigs previously injected in the same places with filterable virus. In none of the above experiments was the vaccination with *BCG* followed by adverse or unusual effects. It is therefore concluded that *BCG* vaccination is innocuous for children of tuberculous mothers.—*Éléments filtrables du bacille tuberculeux et BCG, T. D-S. Monaldi, Rev. d. l. Tuberc., January, 1933, i, 38.*—(*A. E. M.*)

Cutaneous Allergy after *BCG*.—Six hundred and forty-seven intracutaneous tuberculin tests, employing 0.1 cc. of a 1:1000 dilution of O. T., were performed in infants up to five years of age who had been vaccinated with *BCG*. For purposes of interpretation the clinical material was grouped by age and degree of exposure to contagion, and the positive tests were graded as feeble, moderate and intense. The percentage of intense reactions was found to be twice as great in those exposed to massive infection than in those exposed to moderate infection, and four times as great as in those without known contagion. This seems to indicate that intense reactions are the result of virulent infection. On the other hand, the relatively low percentage of intense reactions compared to that of moderate and feeble reactions in those exposed to massive infection, especially in the first three years of life, seems proof of the resistance to virulent superinfection that *BCG* confers. The proportion of feeble reactions was the same, regardless of the degree of exposure to contagion. This is interpreted as proof that feeble reactions are due to *BCG*, a view many phthisiologists hold.—*Sur la signification de l'intensité des réactions allergiques chez les enfants vaccinés avec le BCG, L. Sayé and J. Domenech, Rev. d. l. Tuberc., November, 1932, xiii, 901.*—(*A. E. M.*)

Causal Factors in Tuberculosis.—Because of the high mortality caused by tuberculosis in the Tyneside area, an intensive investigation was conducted from October, 1930, until December, 1931, in the hope of elucidating problems of incidence and infection. This investigation of 2,963 families and 1,033 tuberculous persons was conducted in the Tyneside towns of Jarrow and Blaydon. These two towns were about equally populated but presented contrasting tuberculosis statistics. It became evident that poverty caused tuberculosis rather than that tuberculosis caused poverty. The principal results of poverty were overcrowding and undernourishment. In the statistical association found to exist between overcrowding and tuberculosis, the overcrowding preceded the onset of the disease and it seemed highly probable that no third factor, as poverty, was required to link the two. It was felt that overcrowding caused tuberculosis by leading to a lowered resistance to disease in general. The contention that the presence of a case of tuberculosis in a family should lead to the occurrence of a second case more often in overcrowded than in nonovercrowded families was difficult to demonstrate with any certainty because the greater incidence may have been due to greater risk of exposure. Undernutrition was found to be a definite cause of tuberculosis. Figures showed that tuberculous families consumed

less meat, butter, and milk per head than the nontuberculous families. The greatest deficiency was found in the consumption of milk. It was thought that the shortage of milk had possibly more important aspects than mere undernourishment and that, perhaps, vitamines, enzymes, or some unknown constituents of fresh milk had a considerable bearing on the body's defenses against tuberculosis. It was shown that insanitary dwellings were more frequently occupied by tuberculous families but there was no evidence directly pointing to this being a contributory cause of the disease. The study of racial factors was narrowed down to a comparison of Irish and English families. The relatively high incidence and mortality rate of tuberculosis in the Irish was considered the most important factor of the high mortality in the area under investigation. Supervision exercised by maternity and child-welfare clinics was definitely a factor in the suppression of tuberculosis. The opinion that a peculiarly rapid pulmonary form of the disease was common in the area was confirmed.—*Causal Factors in Tuberculosis. Report of the Tyneside Inquiry, Brit. M. J., June 10, 1933, no. 3779, 1018.*—(*T.O. R.*)

Trauma in Pulmonary Tuberculosis.—In two cases violent trauma to the chest caused definite aggravation of a preëxisting but unrecognized pulmonary tuberculosis. In each the causal connection was established by haemoptysis shortly following the trauma. It is quite rare that such a direct causal connection can be established.—*Zur Frage der traumatischen Lungentuberkulose, R. Blum, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 744.*—(*M. P.*)

Bronchial Asthma and Tuberculosis.—Of 492 patients with asthma, 121 showed roentgenological evidences of pulmonary tuberculosis, and it appeared likely that in 16 cases tuberculosis was the cause of the asthma. The two diseases are not mutually exclusive, and it is more likely that tuberculosis may cause asthma than that asthma may produce tuberculosis. Usually bronchial asthma does not activate tuberculous processes, but a careless use of protein therapy may do so. Tuberculin should not be used for nonspecific desensitization in asthma. Thus far, the only aetiological relation between tuberculous allergy and allergic asthma is the fact that patients with either disease may be sensitive to both allergens.—*Bronchialasthma und Tuberkulose, K. Hajós, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 748.*—(*M. P.*)

Pulmonary Tuberculosis Following Follicular Tonsillitis.—Tuberculosis of the tonsils is not rare, but the diagnosis is only made postmorten or by histological findings in enucleated tonsils. *In vivo* and macroscopically, it is almost impossible to make a correct diagnosis. Hyperplastic tonsils are frequently found tuberculous. Acutely diseased tonsils alter the anatomical picture to the extent that the protective barrier to the entrance of microörganisms is removed. The author traces the lymphogenic route of infection to the lungs by direct communication through the lymphatic system which he illustrates diagrammatically.—*Spezifische Lungeninfiltrationen nach Tonsillitis follicularis, L. Vajda, Ztschr. f. Tuberc., 1932, lxvi, 232.*—(*H. J. C.*)

Tonsils as Portal of Entry.—Primary active tuberculosis of the tonsils is very rare and occurs practically only in childhood.* Two such cases are reported in detail. In regard to treatment, it is of no importance whether a tonsillar tuberculosis is primary or secondary; at all events, it must be treated as a constitutional and not as a localized disease. The clinical diagnosis of tuberculosis of the tonsils may be impossible without biopsy.—*Die Tonsillen als Eintrittspforten für Tuberkelbacillen im Kindesalter, S. A. Siwe, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 279.*—(*M. P.*)

* Tuberculous infection of the tonsils (and adenoids) in healthy adolescents and adults is by no means rare. In such persons, who have never shown the least manifestation of tuberculosis, especially pulmonary, the tonsillar infection is to be regarded as representing foci of primary infection. In the absence of local symptoms, there is one feature that may suggest a diagnosis of tuberculous infection of the tonsils. This is unilateral hypertrophy, which may warrant further inquiry, such as complete enucleation and search for tubercle or (and) tubercle bacilli by the usual methods of examination of histological sections, bacteriological cultivation, guinea-pig inoculation of tissue or (and) isolated cultures, etc. However, unilateral hypertrophy is not pathognomonic of tonsillar tubercle, nor does its presence *per se* demand enucleation for diagnosis. The individual person should be searched for collateral evidence of infection; for instance, enlarged and shotty and non-resolving cervical lymph nodes (especially the deep cervical beneath the mandibular ramus, the so-called "tonsillar lymph node") on the same side as the hypertrophied tonsil, not to mention significant changes in the pulmonic hilum.—(*A. K. K.*)

Tuberculous Infection in Student Nurses.—Observations were made on 126

student nurses, 20–25 years old, at the University Hospital in Upsala. The average period of observation was three years. Twenty-four per cent were Pirquet negative. At the beginning of the study, excluding those in hospital service before the application of the test, and those previously exposed to tuberculosis, 41 per cent were negative. No definite difference in the incidence of positive reactions to tuberculin was noted in nurses of rural and urban origin. On the average, positive reaction to tuberculin developed after 10 months of hospital service, but the average period was only 4 months among those heavily exposed to tuberculosis. Of the 126 nurses, 22, or 17 per cent, acquired some form of tuberculosis in the course of training, 75 per cent of the cases developing in the first year. The morbidity was significantly greater than the general rate for women of the same age. Nurses with previous exposure had a lower morbidity rate than those not previously exposed. Those already positive to tuberculin at the beginning of the period of training also had a lower morbidity rate. Clinically and roentgenologically the tuberculous process in the lung pursued a different course in the tuberculin negative and tuberculin positive cases.—*Zur Kenntnis der tuberkulösen Infektion bei Krankenpflegeelevinnen, A. Kristenson, Acta Tuberc. Scand., 1933, vii, 1.*—(*E. R. L.*)

Congenital Tuberculosis.—A 2 year old girl was clinically diagnosed as having tuberculous meningitis with generalized miliary tuberculosis, which was verified anatomically. In the interlobar space of the left upper lobe was a subpleural caseous focus, the size of a pea, with tributary pulmonary nodules enlarged and chalky dry, apparently a primary complex. In the liver there were found 6 subcapsular gray yellow tubercles about 3 mm. in size, distinguished from the miliary tubercles by sharply demarcated scar-tissue investments. The drainage nodes were definitely enlarged, partly calcified and partly caseocalcerous. The remaining nodes were negative. Histologically the hepatic and pulmonary foci revealed the typical picture of encapsulated primary foci. The hepatic and hepatic drainage foci are viewed as intrauterine infections. The same origin is believed possible for the pulmonary focus. The duration of life of the child is exceptional for congenital tuberculosis. The mother is still well (2½ years after the child's birth). Only an uncle of the child is tuberculous. In spite of this the author considers the hepatic changes to have occurred in intrauterine life. Obviously only a mild infection existed which would lead to healing.—*Zur Kenntnis der angeborenen Tuberkulose, H. Chiari, Virchow's Archiv. Pathol. Anat., 1932, cclxxxv, 779.*—(*H. J. C.*)

Spontaneous Pneumothorax in Infancy.—In a tuberculous infant, aged 11 months, a thoracocentesis revealed air. An X-ray plate following this procedure showed pneumothorax, as well as a cavity in the lung. The child subsequently died of tuberculous meningitis and was autopsied. This is one of the few instances of spontaneous pneumothorax of tuberculous origin that have been reported in infancy.—*Pneumothorax spontané d'origine tuberculeuse chez un nourrisson, B. L. Echnique and J.-M. P. de la Torre, Arch. Méd. Enf., May, 1933, xxxvi, 295.*—(*M. D.*)

Pathology of Pulmonary Infiltrations in Childhood Tuberculosis.—Pathologicoanatomical studies in 6 cases considered, clinically and roentgenologically, pulmonary infilrations (collateral inflammation) about a primary focus are reported. The findings recorded in the literature and these cases indicate that the clinical-roentgenological notion of pulmonary infiltration (collateral inflammation) encompasses to a certain extent various pathologicoanatomical pictures: from hyperaemia and pulmonary collapse through a range of manifold alveolar exudative forms (protein-like liquids, fibrin, leucocytes, lymphocytes, large mononuclear cells) with interstitial inflammatory changes to productive tuberculous tissue. These findings explain the varying persistence of the infiltrations.—*Pathologische Anatomie der Lungeninfiltrierung (kollateralen Entzündung) bei Kindertuberkulose, J. Zeyland, Ztschr. f. Tuberk., 1933, lxviii, 23.*—(*H. J. C.*)

Roentgenography of Chest in Children.—A roentgenogram taken from one aspect alone gives no conception of depth. The use of lateral and of oblique, as well as anteroposterior views of the chest, permits of a more truly graphic view of the thoracic contents. Considerable experience must be obtained in interpreting oblique and lateral plates, the most confusing normal shadows being those of the scapulae and of the ribs, particularly when superimposed or rachitic. The paravertebral portions of the lung and other structures of the retrocardiac angle are ordinarily obscured in an anteroposterior plate, particularly in children, where the shadows of the heart, diaphragm, and liver are relatively large. Only with a variety of views can one in some cases distinguish between hilar adenopathy and collapse or consolidation of the right middle lobe. In the diagnosis of interlobar pleurisy the lat-

eral and oblique views are indispensable.—*Roentgenographic Study of Pulmonary Disease in Childhood, H. S. Reichle and C. H. York, Am. J. Dis. Child., April, 1933, xlv, 771.*—(*M. D.*)

Demonstration of Tubercle Bacilli in Childhood Tuberculosis.—This is a very complete study on the question of how frequently tubercle bacilli can be demonstrated in the various forms of tuberculosis in childhood. The method of choice is animal inoculation with stomach washings. If this method is used methodically, it is possible in a large number of cases to demonstrate the presence of the tubercle bacilli, even in such forms of tuberculosis that are usually not considered to be open. Once an open pulmonary tuberculosis is established, bacilli may be excreted over a period of months and years after an apparent clinical cure. The majority of cases of tuberculous meningitis showed tubercle bacilli in the gastric washings. The same is true of the benign chronic apical indurations in older children. A certain percentage of bronchiectases yield positive results. Bacilli are frequently demonstrated in the so called primary and secondary infiltrations. In uncomplicated pleurisies bacilli were never demonstrated. In tuberculosis of the mediastinal lymph nodes, bacilli were found in four out of five cases, and in active tuberculosis of the bronchial lymph nodes in two out of eleven cases. In children in whom only an "increased hilar marking" was reported, bacilli occurred in 25 per cent of the cases. Of 7 patients with erythema nodosum, six were positive. In extrapulmonary manifestations of tuberculosis, with the exception of tuberculous meningitis, bacilli were found in 50 per cent. Tubercle bacilli may be excreted without demonstrable pulmonary foci. A child should never be considered cured unless three animal inoculations with gastric washings are found negative. Bacilli were found repeatedly in children whose sedimentation rate and whose haematological picture was completely normal.—*Untersuchungen über die tatsächliche Häufigkeit offener Lungentuberkulose im Kindesalter, Opitz, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 296.*—(*M. P.*)

Irradiated Air in Childhood Tuberculosis.—It was formerly believed that only the direct application of ultraviolet rays had any therapeutic value. Later, irradiated substances were used in the form of foods or medication with similarly good results. The ultraviolet rays modify and increase the complementary powers of blood-serum. It was noted that during treatment with ultraviolet rays, the attendants in the same room showed improvement in their general physical condition. Their appetite improved and, intellectually they became more alert, and their resistance to fatigue was increased. While it is difficult to explain the good results obtained by the use of irradiated air, the benefits, nevertheless, are indisputable. Cijewsky, in 1930, reported that ionized air is of great value in tuberculosis, and it is noteworthy that during ultraviolet radiation the surrounding atmosphere is richly ionized. Two groups of 13 children each were made the subjects of this study. One-half received treatment with irradiated air and the other half was used as controls. The two classes were arranged in as parallel groups as possible regarding the type and extent of disease. The forms of tuberculosis involved were hilar, peribronchial, peritracheal, lymphatic, serous, pulmonary, and epituberculosis. The control group continued on the ordinary treatment and those receiving the irradiated air were given no other medication. The treatments were given twice daily, and the children were allowed to play or roam around the room at will during the seance. At 7:30 A.M. the ultraviolet lamp was turned on with no one in the room. At eight o'clock the children entered the room, fully clothed. At 8:15 A.M. the lamp was turned off. At 8:30 the treatment was terminated. In the evening a similar program was carried out. After each treatment, the patients were carefully studied and examined. There were no serious complications. One patient developed a slight but short-lived haemoptysis. Another complained of a burning sensation in the throat but this was only transitory. All patients developed slight pigmentation of the skin on the exposed surfaces. The children slept soundly for two hours after the treatment and upon awakening were more refreshed and less fussy than usual. Gain in weight was more marked while receiving irradiated-air therapy. In the control group, gain in weight was less evident. The tuberculin reaction following treatment was more intense than before. This bespeaks augmented allergy. The Arneth count after treatment showed a favorable deviation to the right and the blood sedimentation rate paralleled the Arneth count in denoting a favorable prognosis.—*Le inalazioni di aria irradiata (u.v.) nella tuberculosi dell'infanzia, Monaco and Semizzi, Lotta contro la Tuberculosi, November, 1932, iii, 1198.*—(*U. E. Z.*)

Severe Reaction to Gold Salts in Child.—It is commonly thought that children are more tolerent to the therapeutic

introduction of gold salts than adults. A girl of 14, after the administration of 0.7 gm. of aurothiosulphate, developed a wide spread pruritic urticarial and vesicular eruption which subsequently desquamated. After a lapse of 15 days, another dose of 0.15 gm. was administered. Within 3 days signs of intense intoxication appeared, with hyperthermia, diarrhoea, metrorrhagia, buccopharyngitis, and bilateral conjunctivitis. This case is of interest in that the urine showed no albuminuria; a marked myelocytosis (45 per cent) and eosinophilia (17 per cent) appeared in the blood; and because such a virulent response to small doses of gold salts is rare in children. Questioning revealed that hypersensitiveness to certain foods had been noted in infancy, which suggests an atopic terrain as the explanation for the unusual reaction.—*Accidents auriques graves à la suite de doses faibles de thiosulfate double d'or et de sodium chez un enfant ayant des antécédents d'anaphylaxie, P. F. Armand-Delille, P. Hechter and V. Bayle, Rev. d. l. Tuberc., December, 1932, xiii, 1031.—(A. E. M.)*

Types of Tubercle Bacilli in Domestic Animals.—Analysis of statistics shows that tuberculosis in cattle has materially decreased in the past fifteen years. Avian tuberculosis has shown a mounting morbidity and an increase of infection in swine. The tubercle bacillus is an obligate parasite and propagates itself only within the animal body. It does have the ability of adapting itself to changes in environment, and, in course of time, has formed more or less distinct types. Each type is associated with a certain animal as its optimum host. These types may or may not be on the way toward specific adaptation to host. Although each type may have its optimum host, it has not lost the capacity for finding suitable soil for growth in other species. Some of the phenomena associated with heterologous infection have a practical bearing on the general prophylaxis of tuberculosis. Bovine infection, the cause of by far the most cases of cattle tuberculosis, has been shown as present in man, swine, horses, goats, sheep, dogs and cats. Hence, all animals infected with bovine tuberculosis tend to keep the disease alive in any region even though it be eliminated from cattle. The hazard of human tuberculosis in animals is slight, with the exception that monkeys and parrots seem easily infected. The reason may be lack of infective contacts. Occasional human infections are reported in cattle and in swine although the latter are less resistant than are cattle. Pigs are more susceptible to bovine and avian infections. Tuberculosis in farm poultry is almost always due to the avian type of tubercle bacillus. Few cases of avian infection by mammalian bacilli are reported. But the avian tubercle bacillus plays a large part in the tuberculosis of swine, and it can initiate tuberculous lesions in cattle. European literature indicates the occasional finding of human tuberculosis caused by avian bacilli. It is apparent that practically all varieties of tubercle bacilli have a capacity for heterologous host relations. Some of these are of live-stock sanitary and public-health importance. As the optimum-host relations of one of the bacillary types become interrupted by hygienic efforts, the likelihood of other types to supplant it is not altogether an imaginary one. As yet, lesions in most heterologous hosts are rather benign but they will not be so in the future.—*The Three Types of Tubercle Bacilli in Live Stock Sanitary Control Work, L. Van Es, J. Am. Veterin. Med. Ass., March, 1933, lxxxii, 407.—(J. F. B.)*

Eradication of Tuberculosis in Domestic Animals.—Considerable progress has been made in the control and eradication of animal tuberculosis. The incidence of bovine tuberculosis has been reduced. In the first survey, made in 1922, it was estimated that 4 per cent of all cattle were infected with tuberculosis. Present estimations give the figure as 1.4 per cent. In only 93 of 3,072 counties was tuberculosis in cattle found to be over 7 per cent, while in 2,840 counties the incidence was less than 1.0 per cent. There are now 181,068 accredited herds, and 231 counties have been added to the modified accredited list. Johne's disease has been reported in 11 states, and 268 cattle have been condemned. The salvage obtained for slaughtered infected cattle continues to be very low. It is at present approximately $11.00 as compared with $46.50 in 1929. Avian tuberculosis continues to be very prevalent in the Central and Northern states. Records of the meat inspection division of the bureau of animal husbandry show a gradual reduction in the percentage of tuberculosis found among cattle and hogs. Some 11.4 per cent of all hogs slaughtered showed signs of tuberculous infection, but only 83,260 of the 5,000,000 were condemned as unfit for food. The tracing of the origin of tuberculous animals has been advanced in the past year.—*Progress of Co-operative Tuberculosis Eradication Work, A. E. Wight, J. Am. Veterin. Med. Ass., March, 1933, lxxxii, 420.—(J. F. B.)*

Tuberculosis in Range Cattle.—Much progress in tuberculosis eradication work

has been made. It is the belief that great damage has been done to the cattle industry by unnecessary restrictions upon the movement of cattle from the clean areas of the west by insisting that all animals be tuberculin-tested. Overenthusiasm in the establishment of accredited areas in the range area has contributed to the impression that a dangerous condition exists. This is not true. Tuberculosis is not a natural attribute of the cattle from the range and semirange districts. In almost every instance the tuberculous infections found have been traced to imported breeding or dairy animals. For the year 1932, 1.9 per cent of all cattle tested with tuberculin reacted positively. In the 17 Western states the percentage was only 1.1. Of these 21,015 reactors in the Western states 12,837 were in California where there are many infected dairy herds. In Utah no infection has been found in range herds. In Arizona about one-tenth of one per cent of range cattle were positive and in Texas almost none. Several other states show similar figures. Packing house studies reveal similar results. Data demonstrate that range cattle are naturally free from tuberculosis, that most outbreaks have been traced to the entry of infected breeding animals, that the present incidence of tuberculosis is very low, and that its occurrence has constantly decreased as farm and dairy herds have been accredited.—*Accrediting Range and Semi-Range Cattle as Tuberculosis Free, H. E. Mollin, J. Am. Veterin. Med. Ass. March, 1933, lxxxii, 432.*—(*J. F. B.*)

Tuberculosis of Epicardium in Cow.—A three-year-old cow, apparently healthy, was slaughtered, and found to have tuberculosis of the right lung, tracheobronchial lymph nodes and pericardium and epicardium. The latter was almost neoplastic in appearance: it was nodular and in a clustered arrangement. It did not extend into the myocardium. Histological examination left no doubt as to the identity of this abnormal tissue. The animal had actinomycosis in a submaxillary and prescapular lymph node.—*Tuberculous Lesions of the Epicardium of a Cow, W. L. Feldman, J. Am. Veterin. Med. Ass., January, 1933, lxxii (n. s. xxxv), 104.*—(*H. S. W.*)

Control of Johne's Disease.—The necessity of controlling paratuberculosis in this country is a problem of greater importance than many realize. The disease spreads only in the traffic of diseased animals. There are two methods for its control. The first is a procedure for early diagnosis, to the end that traffic in animals may be stopped during the incubation period. The other lies in vaccination, by which exposed animals may be protected from the infection. Since 1926, control measures have been studied in a herd of about 30 animals. Fifteen of these have died of Johne's disease, and all the others have shown evidence of infection. All were periodically tested. Johnin, avian tuberculin and complement-fixation tests were used. All recent tests have been made intravenously with avian tuberculin. This tuberculin is standardized carefully, so that a 10-cc. intravenous dose shows no reaction in normal cows of average size. Overdosage gives sharp, immediate reactions and underdosage delayed reactions. A typical positive reaction-curve begins in three to five hours after infection, reaches its peak from the fifth to eighth hour, and then declines rather rapidly to normal by the eighth or tenth hour. Animals with extensive infection frequently do not react well or at all to allergic tests. Clinical observation and confirmatory complement-fixation tests are employed in this group. A rise in temperature of 2° or more from the fifth to eighth hour after infection is interpreted as a positive reaction. In addition to the fever there are usually general signs present in ill animals. The results of these tests are reasonably consistent and accurate. Control studies in naturally-infected herds have also been made. In four of these the disease has been eliminated. In two others little progress has been made in eradicating the disease. This may be due to the fact that infected animals are missed by the tests or the disinfecting processes have not been efficient. There are no data as to the viability of the bacillus of Johne's disease in the soil, but certainly avian tubercle bacilli can persist much longer in soil than can the mammalian types. Complement-fixation tests have been conducted in these herds routinely about once a month. They agree with the allergic tests in a large percentage of cases. This test is probably the best available one for the diagnosis of the disease in those animals which do not react to allergic tests. But it is not a specific test, since tuberculosis must be eliminated first, because human tubercle bacilli are used for antigen. Probably any kind of infection with acid-fast bacilli would give a positive complement-fixation test.—*Studies on the Control of Johne's Disease, W. A. Hagan and A. Zeissig, J. Am. Veterin. Med. Ass., March, 1933, lxxxii, 391.*—(*J. F. B.*)

Tuberculin-Reacting Cattle without Lesions.—The tuberculin test has limitations. There have been certain animals with positive tuberculin reactions that have never shown evidences of tuberculous lesions.

The term, "no-lesion," is used in preference to the less accurate "no visible lesion." The percentage of no-lesion reactors varies greatly in different sections of the country, but it is agreed that, when great numbers of tuberculin tests are made, this percentage is high enough to present a serious problem. The explanation of these no-lesion reactors may be that the cattle are infected with human or avian tubercle bacilli, or with saprophytic microörganisms of the acid-fast group or with Bang's disease. To eliminate the condemnation of reacting but nontuberculous cattle, studies have been made with the herd as a unit. Each herd gave a history of freedom from tuberculosis. In the first group 15 herds were studied in which there was but one reactor per herd. Retests were made in 90 days. These reactors remained in their own herds for three months and were then killed and studied in great detail. Suspicious lesions were found in only one animal, and cultures, inoculations into animals and microscopical study of tissues failed to show tuberculosis in these lesions. A second retest of the herds 6 months later gave all negative reactions. A second group of 13 herds in another county was studied in a similar way except that each of these herds presented two reactors. These reactors were removed from their herds and segregated. One of these animals was negative on the first retest: the other twelve gave positive reactions. On the third test only six were positive and on the fourth none. Thus the sensitization disappeared. Each animal received 10 tests with mammalian tuberculin and 6 tests with avian tuberculin. Only one cow gave a consistent response to either product. A guess as to the cause of the sensitization would be that the avian tubercle bacillus was the probable offender. There are reasons, however, for not incriminating the avian tubercle bacillus. It seems that the eradication of avian tuberculosis may be necessary to eliminate no-lesion reactors in cattle tested with mammalian tuberculin. It is conceivable that the human bacillus and also saprophytic acid-fast microorganisms may be responsible for these no-lesion reactors. From the data presented it seems justifiable to state that a carefully taken herd-history should supplement the tuberculin test and that no-lesion reactors may be left with the herd with safety.—*A Detailed Study of No-Lesion Tuberculin Reacting Cattle, E. G. Hastings, W. Wisnicky, B. A. Beach and J. McCarter, J. Am. Veterin. Med. Ass., April, 1933, lxxxii, 565.*—(*J. F. B.*)

Avian Tuberculosis in Hogs.—In a hog the lymph nodes were enlarged and "watery" and suggested leukaemia. The spleen was five times normal size and over its dorsal surface presented 7 or 8 purplish, slightly elevated areas 1.25 or 1.5 inches in diameter, resembling rosettes with slight roughening and irregularly radiating striae. Smears from these revealed large numbers of acid-fast bacilli which, when isolated in culture, produced widespread, progressive tuberculosis in chickens and no disease in guinea pigs. The spleen from another hog appeared normal save for a few small (0.5 inch) swellings on the surface. From such areas a few acid-fast bacilli were found and cultures obtained. These inoculated into animals and fowls proved to be avian tubercle bacilli.—*Two Unusual Cases of Tuberculosis in Hogs Caused by the Avian Type of Tubercle Bacillus, A. B. Crawford, Journ. Amer. Veterin. Med. Ass., July, 1933, lxxxiii (n. s. xxxvi), 110.*—(*H. S. W.*)

Human and Avian Tubercle Bacilli in Hogs.—Specimens of tuberculous lymph nodes from two hogs that had been fed city garbage yielded typical human tubercle bacilli in one instance and typical avian bacilli in the other. About one-half of the hogs so fed show tuberculosis of the cervical or mesenteric lymph nodes or a combination of the two and occasionally a carcass will have extensive lesions or even miliary tuberculosis.—*Human and Avian Types of Tubercle Bacilli Recovered from Swine, C. D Stein, Journ. Amer. Veterin. Med. Ass., July, 1933, lxxxiii (n. s. xxxvi), 105.*—(*H. S. W.*)

Roentgenology of Thorax of Monkeys.—This study shows a number of characteristic roentgenograms of pulmonary diseases in monkeys, with particular reference to tuberculosis. Roentgenological examination is important in the diagnosis of such diseases, and is an important tool in the study of the progress of artificial infections.—*Das normal und pathologische Röntgenbild der Thoraxorgane des Affen, unter besonderer Berücksichtigung der Tuberkulose, A. Nohlen, Beitr. z. Klin. d. Tuberk., February, 1933, lxxxii, 243.*—(*M. P.*)

Avian Tuberculosis in Muscovy Ducks.—Tuberculosis was found in two muscovy ducks from a flock which used premises occupied by a flock of chickens that was probably badly infected. Four of six chickens inoculated with material from one of the ducks developed tuberculosis.—*Tuberculosis of Avian Origin in Muscovy Ducks, W. R. Hinshaw, J. Am. Veterin. Med. Ass., January, 1933, lxxii (n. s. xxxv), 111.*—(*H. S. W.*)

Spontaneous Tuberculous Infection of Guinea Pig and Rabbit.—Bibliographical material is marshalled to show that spontaneous infection of laboratory animals by tuberculosis is not as rare as is commonly supposed. Length of exposure and length of preservation of the animals determines the morbidity rate that will be observed. Spontaneous tuberculosis rarely manifests itself in less than three months. It is reiterated that the usual experimental animals react similarly to spontaneous infection as human beings, and respond either by immunity to reinfection or by development of progressive and often fatal disease. Pathological differentiation between inoculation and spontaneous tuberculosis is often possible. In the latter, pulmonary lesions are invariably present, are frequently caseous and cavitate, and often constitute the only foci to be found. Massive caseous or fibrous involvement of the hilum lymph nodes, mesenteric lymph nodes, kidneys and liver also occurs, but the spleen is rarely involved. Sometimes in young animals osseous and articular lesions occur. The human strains are more often implicated than the bovine in guinea pigs, whereas the reverse is true in rabbits. Avian strains also occur in the latter. It is believed that necessary precautions against such spontaneous infections in experimental work include exclusion of all infected with tuberculosis, as shown by roentgenograms, skin-testing, etc., and careful segregation of all normal animals from experimentally-infected ones, whether the latter present closed or open lesions. Likewise, no experimental laboratory should be run in close physical conjunction with any sanatorium or hospital for tuberculous persons. The conviction is stated and data marshalled to show that such precautions have not been taken in those laboratories from which work tending to show that *BCG* may retain virulence has been reported. Cummings' and Dowd's work is relied on to point out that spontaneous infection has been rather common in the Trudeau Laboratory, a source of particularly incriminating work against the inocuousness of *BCG.—L'infection tuberculeuse spontanée du cobaye et du lapin, A. Calmette, Rev. d. l. Tuberc., February, 1933, i, 114.*—(*A. E. M.*)

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